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## PATENT ABSTRACTS OF JAPAN

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SONG HAN SANG(54) METHOD FOR MANUFACTURING CAPACITOR  
OF SEMICONDUCTOR MEMORY ELEMENT

## (57) Abstract:

**PROBLEM TO BE SOLVED:** To provide a method for manufacturing the capacitor of a semiconductor memory element capable of improving the electric characteristic of the capacitor by improving the step coverage of a lower electrode.

**SOLUTION:** The method includes a stage for successively embedding a plug polysilicon film and a barrier metal film in the contact hole of an interlayer insulation film on a semiconductor board, a stage for depositing a cap oxido film, a stage for exposing the interlayer insulation film and a barrier metal film, a stage for forming the nitriding film of a thin film on the whole face by NH<sub>3</sub> gas plasma processing, a stage for depositing a ruthenium film for a lower electrode on the nitriding film, a stage for removing the cap oxido film and forming the lower electrode after the ruthenium film and the nitriding film are chemically and mechanically polished, a stage for removing the cap oxido film to form the lower electrode, a stage for depositing an amorphous TaON thin film on the lower electrode, a stage for thermally treating and

crystallizing the amorphous TaON thin film, and a stage for depositing the metal film on the crystallization TaON thin film as an upper electrode.

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